User Manual

Mobile Line Hand-held Terminal HT06AT

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1	2009-03-26	First Edition
2	2011-01-13	Chapter „Display“ enlarged

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1 Important Notes

1.1 Symbols

The symbols in this manual are used to draw your attention on notes and dangers.

This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

DANGER
This symbol is used to refer to instructions which, if ignored or not carefully followed, will result in death or serious injury.

WARNING
This symbol is used to refer to instructions which, if ignored or not carefully followed, could result in death or serious injury.

CAUTION
This symbol is used to refer to instructions which, if ignored or not carefully followed, could result in minor or moderate injury.

NOTICE
This symbol and the accompanying text alerts the reader to a situation which may cause damage or malfunction to the device, either hardware or software, or surrounding property.

Reference to source of information
This symbol refers to detailed sources of information on the current topic.

1.2 Safety Notes

- Read this manual carefully before using the operating device. Keep this manual in a place where it is always accessible to all users.
- Proper transportation, handling and storage, placement and installation of this product are prerequisites for its subsequent flawless and safe operation.
- This user manual contains the most important information for the safe operation of the device.
- The user manual, in particular the safety notes, must be observed by all personnel working with the device.
- Observe the accident prevention rules and regulations that apply to the operating site.
- Installation and operation must only be carried out by qualified and trained personnel.

1.3 Intended Use

- The device is designed for use in the industry.
- The device is state-of-the art and has been built to the latest standard safety requirements. However, dangerous situations or damage to the machine itself or other property can arise from the use of this device.
- The device fulfills the requirements of the EMC directives and harmonized European standards. Any modifications to the system can influence the EMC behavior.

NOTICE: Radio Interference
This is a class A device. This device may cause radio interference in residential areas. In this case, the user may be required to introduce appropriate countermeasures, and to bear the cost of same.

1.4 Target Group

All configuration, programming, installation, commissioning, operating and maintenance work in connection with the automation system must be performed by trained personnel only (e.g. qualified electricians, electrical engineers, etc.).

The configuration and programming personnel must be familiar with the safety concepts of automation technology.

The operating personnel must have been trained in handling the controller and be familiar with the operating instructions.

The installation, commissioning and maintenance personnel must have an education which entitles them to work on automation systems.

2 Design and Commissioning

2.1 Unpacking the Device

Unpack all parts carefully and check the contents for any visible damage in transit. Also check whether the shipment matches the specifications on your delivery note.

If you notice damages in transit or discrepancies, please contact our sales department immediately.

2.2 Mounting the Device

The operating device is optional equipped with a hook and a magnet. You can put the operating device to a suitable position with these mounting options.

2.3 Design

2.3.1 Front View with Dimensions

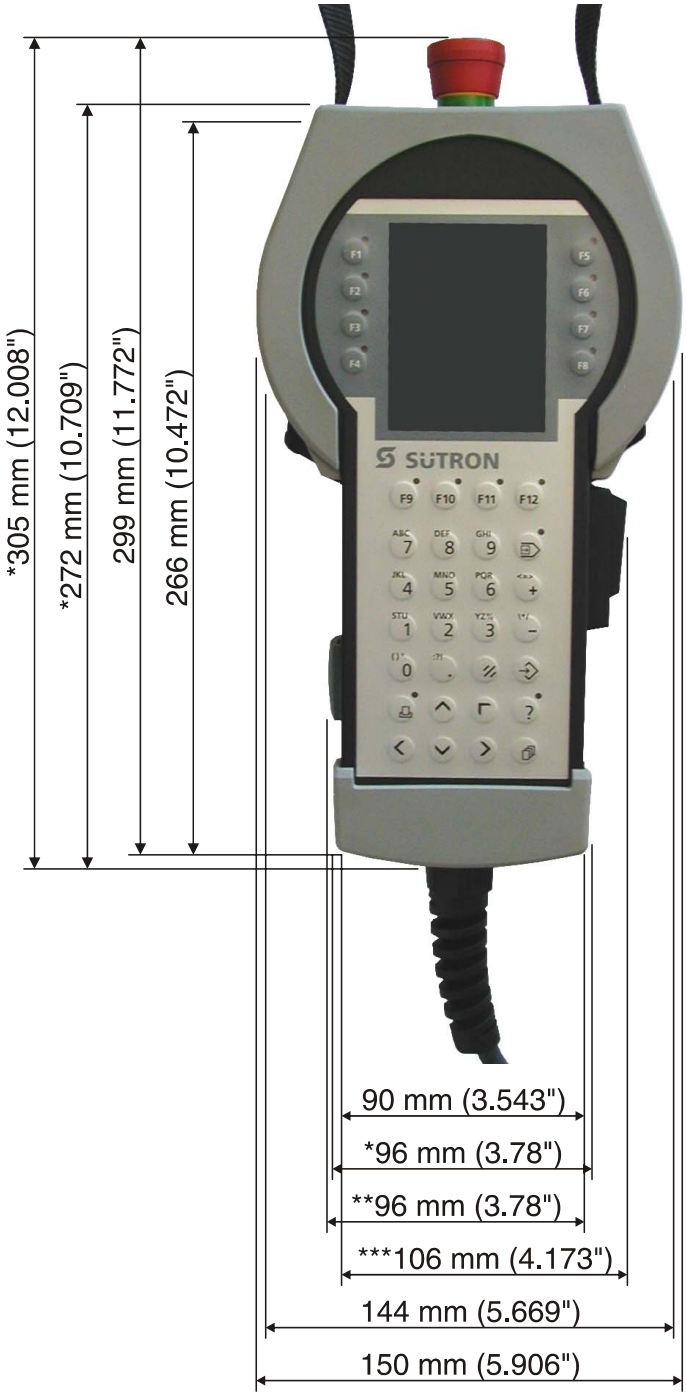


Figure 2-1 Front view with dimensions

* = Measures with protector

** = Measures with USB protecting cap

*** = Measures with consent switch

2.3.2 Side View with Dimensions

Figure 2-2 Side View with Dimensions

* = Measures with protector

2.4 Switching On

The Windows CE operating system is installed on the operating device. Running on the operating system is the visualization runtime.

2.4.1 Loading Procedure on Windows CE Operating System

During the startup phase the operating device makes it possible to modify the configuration with the **cursor** keys and the **enter** key.

The operating device has 3 operating modes:

– Normal (no key is pressed)
– Setup Main (Key **Enter** was pressed)
– Administration (Cursor key followed by **Enter** key was pressed)

2.4.1.1 Launch Structure

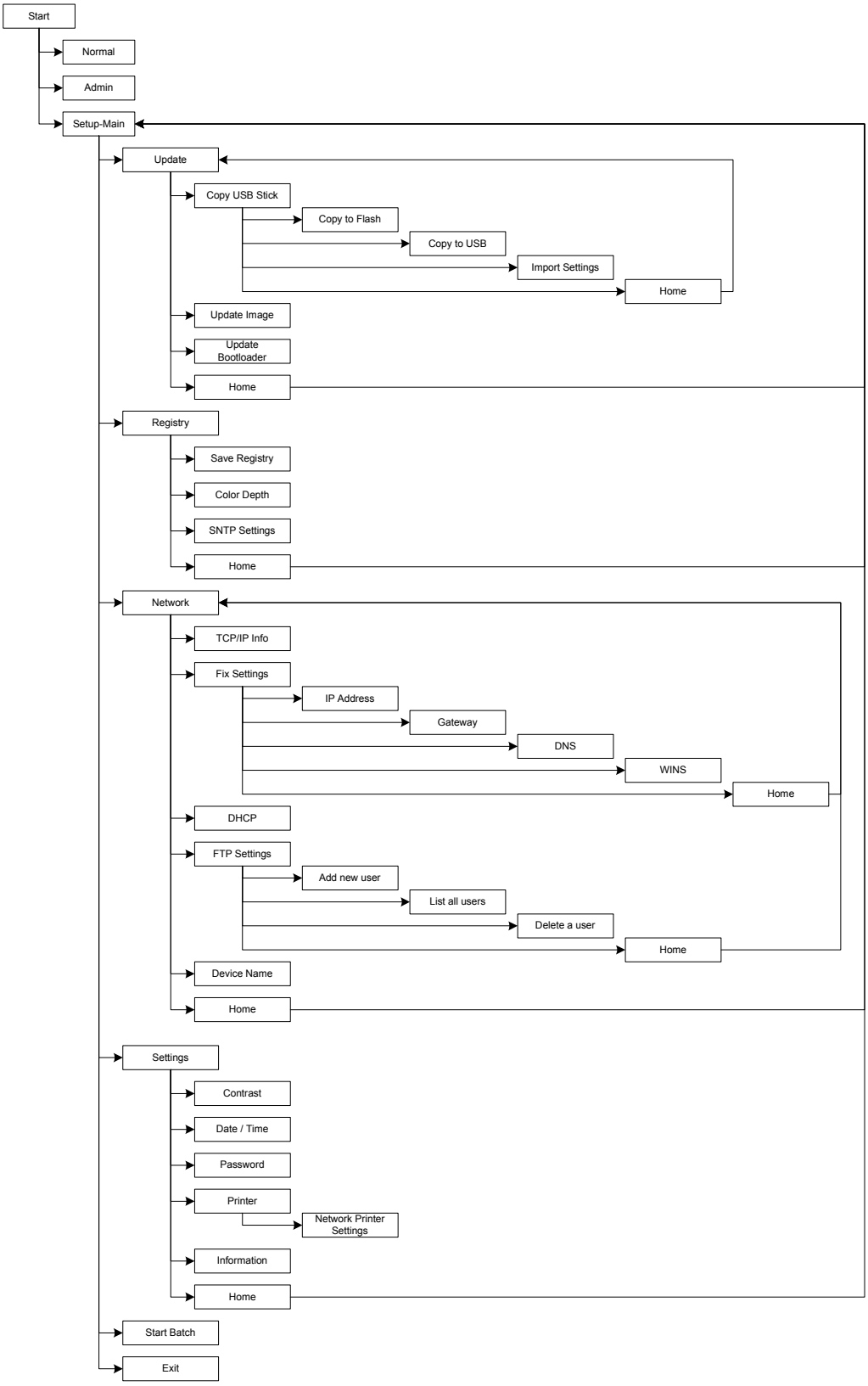


Figure 2-3 Launch structure

2.4.1.2 Normal Mode

The AppStarter.exe program is started from the internal Flash memory.

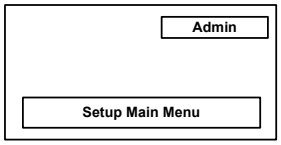


Figure 2-4 Display after startup

The following message is issued if the AppStarter.exe file does not exist.

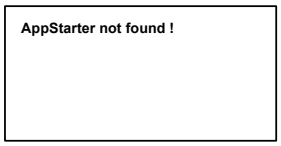


Figure 2-5 Error message after startup

2.4.1.3 Setup Main Mode

If the **Enter** key is pressed during the startup phase, Setup Main mode starts.

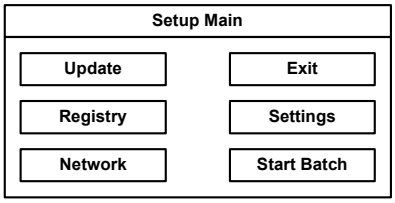


Figure 2-6 Setup Main

Some settings are password-protected. The password is "+-+-".

Update:

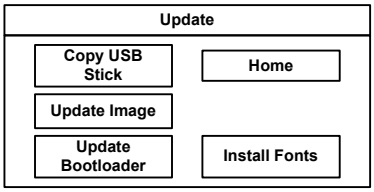


Figure 2-7 Update

Update, Copy USB-Stick:

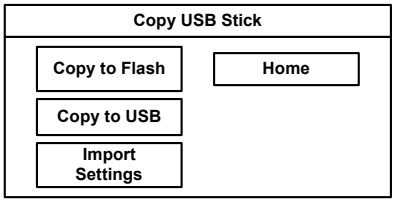


Figure 2-8 Copy USB Stick

Update, Copy USB-Stick, Copy to Flash:

This function copies the data from the USB stick to the internal flash file system.

Several projects can be managed in subdirectories below the directory TSvisRT. If more than one project is in different subdirectories, a choice dialog is displayed. Only directories which contain a project file (*.cb) are listed.

The entire TSvisRT directory or the corresponding subdirectory and the AppStarter.exe are copied into the target directory of the flash file system.

Update, Update Image:

If the „image“ subdirectory on the USB stick contains a „*.nb0“ file, this file is used to perform the image update. There must only be one „*.nb0“ file in this directory.
In this case, the flash registry is always deactivated so that the image is processed with a new default registry.

Update, Update Bootloader:

If the „bootloader“ subdirectory on the USB stick contains a „*.nb0“ file, this file is used to perform the bootloader update. There must only be one „*.nb0“ file in this directory.
The user is informed that the update has been successfully completed.

Registry:

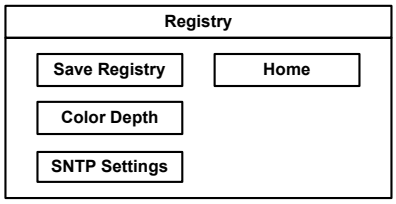


Figure 2-9 Registry

Touch Screen & Registry, Save Registry Settings:

The entire registry is saved.

Registry, Color Depth:

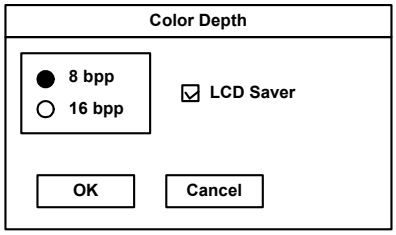


Figure 2-10 Registry, Color Depth

Selection of color depth for TFT displays.

LCD Saver switches the brightness to the lowest value, if no user operation occures for at least one hour.

This entry is able to be password-protected.

Change Display Mode, Color:

Selection of color depth for TFT displays.

LCD Saver switches the brightness to the lowest value, if no user operation occures for at least one hour.

Touch Screen & Registry, SNTP Settings:

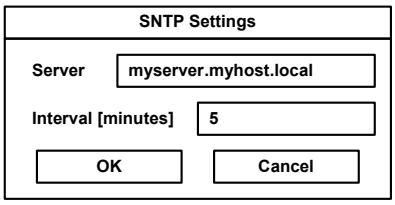


Figure 2-11 Registry, SNTP Settings

You can enter the address of a time server located in the intranet or Internet. The synchronization interval is specified in minutes.

This entry is able to be password-protected.

Network Settings:

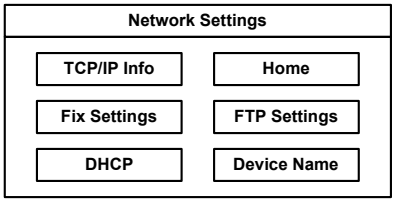


Figure 2-12 Network Settings

Network Settings, TCP/IP Info:

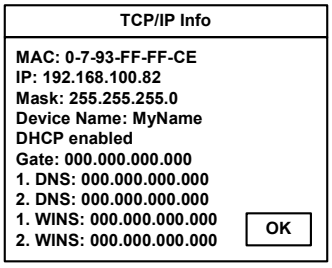


Figure 2-13 TCP/IP Info

The following informations are displayed:

- MAC address
- IP address,
- Subnet mask address,
- Device name,
- DHCP status,
- Gateway address,
- 1. DNS address,
- 2. DNS address,
- 1. WINS address,
- 2. WINS address.

Fix Settings:

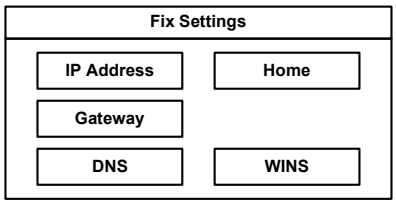


Figure 2-14 Fix Settings

Network Settings, Fix Settings, IP Address:

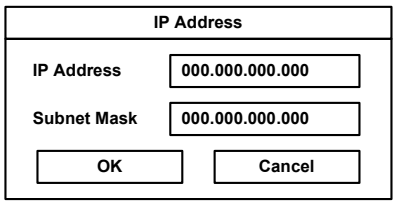


Figure 2-15 IP Address

The system automatically deselects DHCP and optionally enters the settings from the IPSetting.ini file of the USB stick. This file must exist in the root directory of the USB stick.
If no USB stick is connected the information is read from the registry.

This entry is able to be password-protected.

Contents of the IPSetting.ini file:

```
[IPCONFIG]
IPAddress=172.016.042.150
SubnetMask=255.255.255.000
```

All addresses have to be entered in the format "xxx.xxx.xxx.xxx". Numbers smaller than 100 have to be filled up with leading zeros. (e.g.: 192.168.42.1 -> 192.168.042.001).

Network Settings, Fix Settings, Gateway:

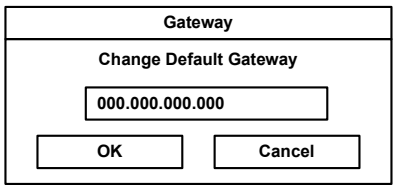


Figure 2-16 Gateway

The system automatically deselects DHCP and optionally enters the settings from the IPSetting.ini file of the USB stick. This file must exist in the root directory of the USB stick.
If no USB stick is connected the information is read from the registry.

This entry is able to be password-protected.

Contents of the IPSetting.ini file:

```
[IPCONFIG]
Gateway=172.016.042.150
```

All addresses have to be entered in the format "xxx.xxx.xxx.xxx".
Numbers smaller than 100 have to be filled up with leading zeros.
(e.g.: 192.168.42.1 -> 192.168.042.001).

Network Settings, Fix Settings, DNS:

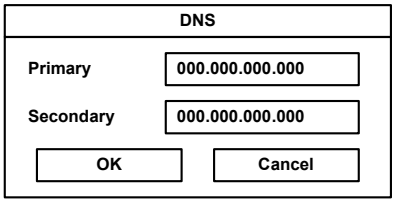


Figure 2-17 DNS

The system deselects DHCP and enters the settings from the IPSetting.ini file of the USB stick. This file must exist in the root directory of the USB stick.
If no USB stick is connected the information is read from the registry.

This entry is able to be password-protected.

Contents of the IPSetting.ini file:

```
[IPCONFIG]
PrimaryDNS=172.016.042.150
SecondaryDNS=172.016.042.151
```

All addresses have to be entered in the format "xxx.xxx.xxx.xxx".
Numbers smaller than 100 have to be filled up with leading zeros.
(e.g.: 192.168.42.1 -> 192.168.042.001).

Network Settings, Fix Settings, WINS:

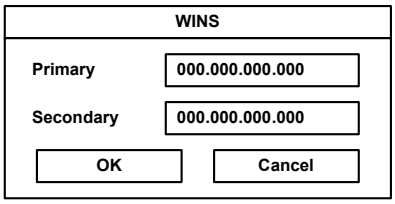


Figure 2-18 WINS

The system automatically deselects DHCP and optionally enters the settings from the IPSetting.ini file of the USB stick. This file must exist in the root directory of the USB stick.
If no USB stick is connected the information is read from the registry.

This entry is able to be password-protected.

Contents of the IPSetting.ini file:

```
[IPCONFIG]
PrimaryWINS=172.016.042.150
SecondaryWINS=172.016.042.151
```

All addresses have to be entered in the format "xxx.xxx.xxx.xxx".
Numbers smaller than 100 have to be filled up with leading zeros.
(e.g.: 192.168.42.1 -> 192.168.042.001).

Network Settings, DHCP:

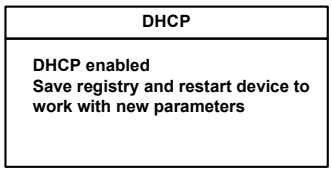


Figure 2-19 DHCP

You may enable DHCP service. You must save this setting when exiting of by using „Save Registry Settings“.

This entry is able to be password-protected.

Network Settings, FTP Settings, Add new user:

You may enter a new user name. You have to assign a password to the user name and to confirm it.

If at least one user name is added you cannot login to the FTP server as anonymous anymore.

Network Settings, FTP Settings, List all users:

All users are listed within a DOS box.

Network Settings, FTP Settings, Delete a user:

You may enter the user name you like to delete.

This entry is able to be password-protected.

Network Settings, Device Name:

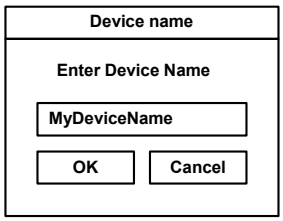


Figure 2-20 Device Name

You can define a device name with up to 14 characters. Via a FTP connection you can access the device with the device name instead of the IP address.

This entry is able to be password-protected.

Settings:

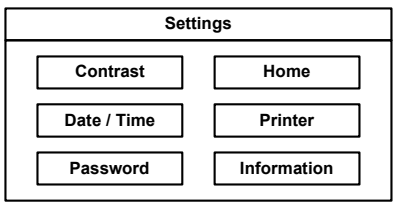


Figure 2-21 Settings

Settings, Contrast:

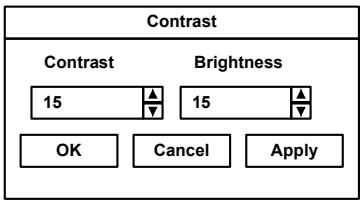


Figure 2-22 Contrast

The operating mode setup main is displayed with default values for contrast and brightness to ensure reading also at faulty values. If you change a value, you have to confirm this in a dialog.

This entry is able to be password-protected.

Settings, Date / Time:

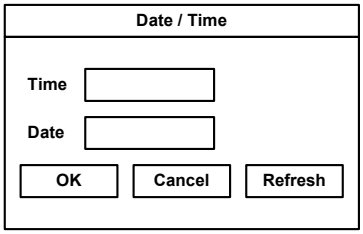


Figure 2-23 Date / Time

Set the date and the time. Push „Refresh“ to update the values.

Settings, Password:

The password can be activated, deactivated or redefined. When the password is activated, all password-protected dialog boxes can only be accessed if the password has been entered successfully.

This entry is able to be password-protected.

Settings, Printer:

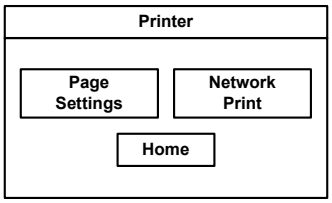


Figure 2-24 Printer

Branching to „Page Settings“ and „Network Print“.

This entry is able to be password-protected.

Settings, Printer, Page Settings:

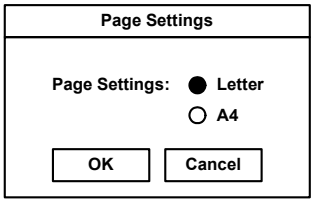


Figure 2-25 Page Settings

Select the paper format, "Letter" or "A4", "Letter" is default.

This entry is automatically stored in the registry.

Settings, Printer, Network Print:

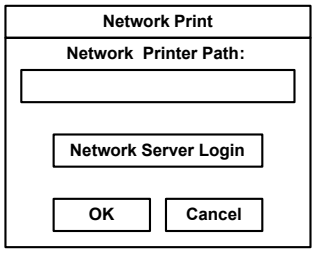


Figure 2-26 Network Print

Enter the network printer path.

This entry is automatically stored in the registry.

Settings, Printer, Network Print, Network Server Login:

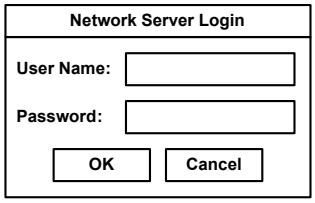


Figure 2-27 Network Server Login, User Name and Password

You may perform a network login.

Enter user name and password. After the confirmation with "OK" the dialog for the input of the domain appears.

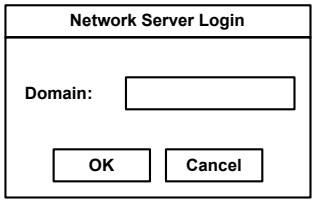


Figure 2-28 Network Server Login, Domain

This entry is automatically stored in the registry.

Settings, Information:

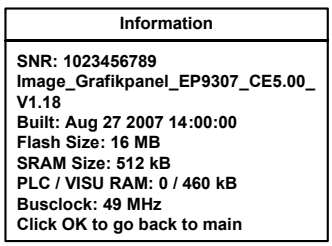


Figure 2-29 Information

The following informations are displayed:

– Serial number,
– Product ID,

- Image version,
- Built version,
- Built date,
- Size of flash,
- Size of SRAM,
- Size of PLC / Visu RAM,
- Bus clock speed.

Start Batchfile:

The **project.bat** file in the **FlashDrv** directory starts, if available.

2.4.1.4 Administration Operating Mode

If you press the **Cursor Down** key followed by the **Enter** key / **Admin** button during the startup phase, the Administration mode of operation starts.

You can use the Admin.ini file to manage the device. This file must exist in the root directory of the USB stick.

This file is used as a dongle to prevent users from changing the device during normal operation.

Possible contents for the Admin.ini file:

Observe upper and lower case for all entries!

Explorer=Off	Deactivates the Explorer in the registry. The change becomes effective on the next device reboot.
Explorer=On	Activates the Explorer in the registry. The change becomes effective on the next device reboot.
Start=explorer.exe	Starts the explorer
Start=MyProgram.exe	Starts the application MyProgram.exe Initial directory is windows. Use the following syntax to start an application on the usb stick: Start=\\\\HardDisk\\MyProgram.exe Use multiple entries to start several applications.
Registry=Default	Destroys the current registry and activates the default registry of the image. The change becomes effective on the next device reboot.
StartRepllog=On	Enables automatic startup of the Repllog.exe program in the registry. The change becomes effective on the next device reboot.
StartRepllog=Off	Disables automatic startup of the Repllog.exe program in the registry. The change becomes effective on the next device reboot.
LaunchTouch=On	The touch variant of the launch will start at devices with keyboard. The change becomes effective on the next device reboot.
LaunchTouch=Off	The standard variant for the device will start. The change becomes effective on the next device reboot.
Lock=On	The buttons **Press for Setup Main Menu** and **Admin** are disabled. If the file „Admin.ini“ is found on the usb stick the button **Admin** is enabled. Therefore the deactivation of the lock is possible. The change becomes effective on the next device reboot.
Lock=Off	All buttons enabled. The change becomes effective on the next device reboot.
Mode=Development	The shell has full functionality. The change becomes effective on the next device reboot.

Mode=Standard	The Shell is restricted: No task bar and task switch available. Desktop contains the launch icon only. The change becomes effective on the next device reboot.
DeviceName=MyName	Defines the device name of the operating device
;DeviceName=MyName	Comment, no impact

2.4.2 Function of the AppStarter.exe Program

The AppStarter.exe program creates all the necessary registry settings and can also store the registry, if desired.

If the Explorer is activated, the system shuts it down. Automatic startup of ActiveSync is also deactivated.

The AppStarter.exe file then starts the TSvisLD_CE.exe file from the Flash File System (FFS).

2.4.3 Function of the TSvisLD.exe Program

The TSvisLD.exe loads the following components into the memory of the operating system in accordance with the instructions in the TSvisRT_CE.ini file:

– User application
– Protocol driver
– TSvisRT firmware

The program then unpacks the compressed application file (*.CB) and starts the TSvisRT Runtime component.

2.4.4 Memory Media Used

The following memory media are used:

Table 2-1 Memory media used

Operating system memory TSvisRT Runtime Protocol driver Application		**Flash file system** **(FlashDrv)** AppStarter.exe Subdirectory TSvisRT\Project name (with TSvisRT Runtime, protocol driver and application)		USB stick (Hard disk)
		Registry settings		Admin.ini IPSetting.ini
		Image storage in Flash		Subdirectory Image
		Bootloader storage in Flash		Subdirectory Bootloader

Legend:

Copying carried out by operating system

Copying carried out by the bootloader

Copying carried out by the Launch.exe

2.4.5 Important Files and Update

Table 2-2 Important files and update

File	Storage location	Update	Function
TSvisRT_CE.INI	Subdirectory **TSvisRT** or **TSvisRT\Projekt** on USB stick	Transfer via programming software on USB stick or FTP server	Initialization file for TSvisLD_CE.exe
SPSTtxxxxxxx.yyy.DLL	Subdirectory **TSvisRT** or **TSvisRT\Projekt** on USB stick	Transfer via programming software on USB stick or FTP server	Protocol driver
*.CB	Subdirectory **TSvisRT** or **TSvisRT\Projekt** on USB stick	Transfer via programming software on USB stick or FTP server	Compressed application file
TSvisRT_CE.EXE	Subdirectory **TSvisRT** or **TSvisRT\Projekt** on USB stick	Transfer via programming software on USB stick or FTP server	TSvisRT Runtime
*.nb0	Subdirectory **Bootloader**	Menu item "Update Bootloader" in operating mode setup main via USB stick	Windows CE Bootloader
*.nb0	Subdirectory **Image**	Menu item "Update Image" in operating mode setup main via USB stick	Operating system Windows CE
AppStarter.EXE	**Root directory** on USB stick	Menu item "Copy USB Stick" in operating mode setup main via USB stick	Starts TSvisLD_CE.exe
TSvisLD_CE.EXE	Subdirectory **TSvisRT** or **TSvisRT\Projekt** on USB stick	Menu item "Copy USB Stick" in operating mode setup main via USB stick	TSvisRT loader
Admin.INI	**Root directory** on USB stick	-	File with administration settings
IPSetting.INI	**Root directory** on USB stick	-	File with settings for IP assignment
starter.bat	**Root directory** on FlashDrv	-	Starts a user-defined application on startup
project.bat	**Root directory** on FlashDrv		Starts a user-defined application from within the launcher

2.5 Identification

The operating device can be identified using the nameplate on the rear of the device.

Figure 2-30 Nameplate (example)

1 Order number
2 Version key (at time of delivery)
3 MAC address
4 Voltage and power specification
5 Serial number

2.5.1 Version Key

The version key provides information on the version level of various components at time of delivery.

3 Control and Display Elements

3.1 Keyboard

The keys are positioned under an environmental-proof polyester foil. You project the operating principle of the keys in the programming software.

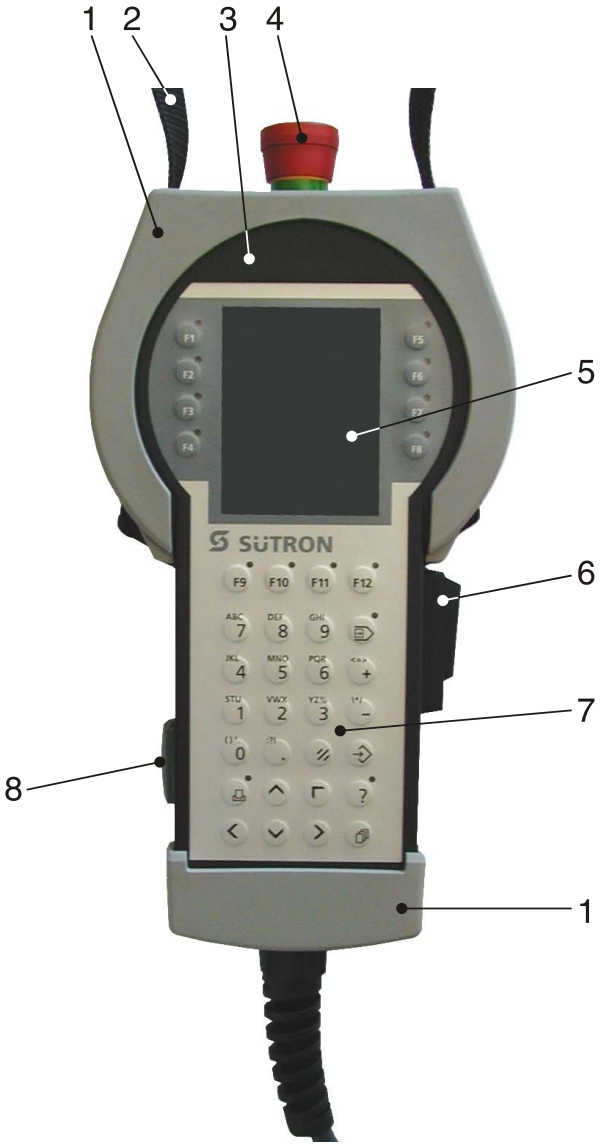


Figure 3-1 Front view

1. Protector
2. Holding belt
3. Enclosure
4. Emergency stop button (option)
5. Display
6. Consent switch on the side (option)
7. Keyboard
8. Cover cap for USB interface

3.1.1 Editing Keys

( ) °
0 The key **0 and ()°** is used for changing data in the editor. The (,) and ° characters can be entered when configuring the **Shift** or **ShiftCase** system variables.

STU
1 The key **1 and STU** is used for changing data in the editor. The S, T and U characters can be entered when configuring the **Shift** or **ShiftCase** system variables.

VWX
2 The key **2 and VWX** is used for changing data in the editor. The V, W and Y characters can be entered when configuring the **Shift** or **ShiftCase** system variables.

YZ%
3 The key **3 and YZ%** is used for changing data in the editor. The Y, Z and % characters can be entered when configuring the **Shift** or **ShiftCase** system variables.

JKL
4 The key **4 and JKL** is used for changing data in the editor. The J, K and L characters can be entered when configuring the **Shift** or **ShiftCase** system variables.

MNO
5 The key **5 and MNO** is used for changing data in the editor. The M, N and O characters can be entered when configuring the **Shift** or **ShiftCase** system variables.

PQR
6 The key **6 and PQR** is used for changing data in the editor. The P, Q and R characters can be entered when configuring the **Shift** or **ShiftCase** system variables.

ABC
7 The key **7 and ABC** is used for changing data in the editor. The A, B and C characters can be entered when configuring the **Shift** or **ShiftCase** system variables.

DEF
8 The key **8 and DEF** is used for changing data in the editor. The D, E and F characters can be entered when configuring the **Shift** or **ShiftCase** system variables.

GHI
9 The key **9 and GHI** is used for changing data in the editor. The G, H and I characters can be entered when configuring the **Shift** or **ShiftCase** system variables.

:?!
. The key **Decimal point and :?!** is used for changing data in the editor. The characters :, ? and ! can be entered when configuring the **Shift** or **ShiftCase** system variables.

<=>
+ The key **Plus and <=>** is used for changing data in the editor. The characters <, = and > can be entered when configuring the **Shift** or **ShiftCase** system variables.

*/
– The key **Minus and */** is used for changing data in the editor. The characters \, * and / can be entered when configuring the **Shift** or **ShiftCase** system variables.

3.1.2 Control Keys

The key **Cursor left** can be configured to directly call up any screen. In the editor, it moves the cursor one character to the left (character selection). This function corresponds to the system variable **KeyCursLeft**.

The key **Cursor right** can be configured to directly call up any screen. In the editor, it moves the cursor one character to the right (character selection). This function corresponds to the system variable **KeyCursRight**.

The key **Cursor up** can be configured to directly call up any screen. In the editor, it moves the cursor up one variable (variable selection). This function corresponds to the system variable **KeyCursUp**.

The key **Cursor down** can be configured to directly call up any screen. In the editor, it moves the cursor down one variable (variable selection). This function corresponds to the system variable **KeyCursDown**.

The key **Cursor home** can be configured to directly call up any screen. In the editor it returns the cursor to the first input variable position. This function corresponds to the system variable **KeyHome.**

The key **Page down** can be configured to page through tables, recipes and messages. This function corresponds to the system variable TabPgDn.

3.1.3 Special Keys

The key **Help** always shows the current help text (online help). A flashing LED indicates that there are system messages. The system message is output in plain text.

The key **Data Release** changes from the menu into the editor. The integrated LED is lit during edit mode. Pressing this key in edit mode exits the editor.

The key **Enter** is used to complete data entry. Pressing this key while the startup screen is displayed opens the setup screen.

The key **Delete** deletes the character beneath the cursor in the editor and removes the selected messages from the data memory.

The key **Print** can be configured as a soft key to activate various print jobs. The LED flashes when a print process is active.

3.1.4 Function Keys

○ The function of function keys can be assigned as required (soft key functionality). The function keys can optionally be used as direct selection keys for menu control or to trigger a function in the controller.

F1

3.2 Stop Push-button / Emergency Stop Push-button

The device can be fitted with an optional STOP push-button or an emergency stop push-button.

The STOP push-button on the operating device ensures that the system to be monitored is shut down safely in accordance with EN 60204-1:1997, Paragraph 9.2.5.3. The stop function can be a Category 0, 1 or 2 stop according to EN 60204-1:1997, Paragraph 9.2.2 and must be defined according to the risk assessment.

Therefore, the stop function of the operating device can be used for a safe machine stop as well as for looping into the emergency stop circuit of the system to be monitored.

The signals of the STOP push-button use different circuits in the two versions of the linkbox. In the case of the linkbox with an emergency stop function, the signals control the stop circuit or emergency stop circuit of the system to be monitored. If no hand-held operating device is connected, the stop circuit or emergency stop circuit, respectively, is closed. In the linkbox without an emergency stop function, on the other hand, the signals of the stop circuit or emergency stop circuit are sent via the STOP push-button. If no hand-held operating device is connected, the stop circuit or emergency stop circuit, respectively, of the system to be monitored is open.

The term "stop looping" has the following meaning: The stop circuit or emergency stop circuit, respectively, of the system to be monitored is looped through the linkbox and not interrupted, irrespective of whether the hand-held operating device is connected to the linkbox (and the STOP push-button has not been operated) or not. This functionality is only available with the linkbox with an emergency stop function.

WARNING
If using a hand-held operating device with an emergency stop button, you must ensure that the connecting cable is securely installed.
A hand-held operating device that is not connected to the machine must be stored out of sight of the user!
Bear in mind that the nearest emergency stop will be activated in the event of danger. If it does not work because it is not connected, this could have fatal consequences!

WARNING
If the hand-held operating device is equipped with a STOP push-button but it is not connected to the linkbox, a stop can not be triggered using the hand-held operating device – the STOP push-button of the hand-held operating device is ineffective!
Install stationary emergency stop buttons that are available at all times on the system to be monitored.

WARNING
If the stop circuit has been implemented as a Category 0 or 1 stop, the stop function must be effective regardless of the operating mode. A Category 0 stop must have priority. The releasing of the STOP push-button must NOT lead to hazardous conditions (also see EN 60204-1:1997 Chapter 9.2.5.3).
The stop function is not a substitute for safety devices.

3.3 Consent Switch

The device can be fitted with an 3-step consent switch. Operating sequences can only be performed if the 3-step switch is set to its middle position. The stop signal is issued when the switch is set to its upper and lower position. After a stop in the lowest position, the release command can only be issued if the switch is fully released and pushed to the middle position again.

Each machine can run in two operating modes, normal mode and special mode. In normal mode (automatic), the machine performs its normal operational tasks. In this mode, safety is provided by closed, isolating protective equipment and/or using active non-isolating protective equipment that blocks access.

The special operating modes of a machine are designed to maintain the normal mode. In this case, safety must be ensured in a different manner than is provided during normal mode because hazardous areas of the machine must be accessed and specific movements must be possible.

In this case, it must be possible to operate the machine at a reduced speed in accordance with the risk assessment, whereby movement is only possible if the consent equipment is actuated simultaneously. The operator must possess the necessary qualifications and training and be familiar with the details of the intended use in accordance with the instruction manual.

The safety-related parts of the controller used to reduce the speed and for the consent equipment must be constructed so that they comply with the EN 954-1 safety category determined on the basis of the risk analysis.

The use of a 2-circuit design for the consent equipment enables compliance with safety category 3 according to EN 954-1:1996. The draft C-standard covering machine tools and processing machinery stipulates the following:
Consent equipment may consist of either a 2-position command unit combined with a stop module or of a 3-position command unit. The use of a 3-position command unit is preferable.

EN 60204 describes the mode of operation of the consent equipment. Based on information gathered from accident research and on the technical solutions currently available, the 3-step consent switch represents state-of-the-art technology. Positions 1 and 3 of the consent switch are "OFF" functions. Only the middle position activates consent. EN 60204-1:1997 is identical to IEC 60204-1, as a result of which the 3-step consent switch is internationally recognized.

The stop category of the consent equipment must be selected on the basis of a risk assessment and must correspond to a Category 0 or Category 1 stop.

Warning!
The consent switch is only suitable for use as a protection function if the person operating the consent switch is able to recognize hazards to personnel in good time and can then immediately initiate hazard prevention measures!
Slower movement speed may also be necessary as an additional measure. The permissible speed must be determined on the basis of a risk assessment.

Warning!
No commands related to hazardous conditions may be initiated by the consent switch alone. A second, conscious start command is necessary (button on hand-held operating device). Only the person operating the consent switch is permitted to be present in the hazardous area.

3.4 Display

DANGER: Toxic
If the display is damaged, avoid touching, swallowing or breathing in the liquids or gases which may leak out!

DANGER: Corrosive
If the display is damaged, avoid touching, swallowing or breathing in the liquids or gases which may leak out!

NOTICE: Damage
Static screen parts which displayed over a longer time period (> 1 hour) may result in so-called image sticking.
Image sticking shows itself visual like a „burn-in effect“. The screen displayed before remains visible after a change of image as shade furthermore. Higher environmental temperatures during the operation can accelerate this effect. To avoid the danger of an irreversible damage, the display must time controlled - 15 minutes are recommended - set with a black screen. Image sticking is a technologically property and only can be prevented by a suitable application. Image sticking is not appreciated by display suppliers as a guarantee reason.

Please follow the instructions in the programming software's help topic "How do I configure a black screen as a screen saver" for making such a screen.

The operating device is equipped with a TFT display.

3.4.1 Setting the Brightness

To be able to set the brightness, you need to use the programming software to setup the system variable **LcdBackLight** in a screen of your choice.

To do so, follow the instructions listed in the programming software's help topic "How do I specify the contrast / brightness setting for the operating device".

In the programming software, enter the following values as lower and upper limits for the representation type.

Table 3-1 Values for the representation type

System Variable	Lower Limit	Upper Limit	Default Setting
LcdBackLight	+ 1	+ 31	+ 15

If you do not configure the system variable **LcdBackLight**, the default setting is used when the device is initialized.

Adjust the brightness to the surrounding conditions at reached operating temperature to be able to read the display optimally.

If you did set up the system variable, you can set the brightness as follows. Open the screen where you set up the system variable and:

1. Press the Data Release key if the data release is not automatically active.
2. Enter a new value for the brightness. To do so, use the keys Plus and Minus.
3. Press the Enter key.
4. Finally press the Data Release key.

The new brightness setting becomes effective immediately after the Enter key is pressed. If necessary, repeat steps 2 and 3 until you are satisfied with the brightness.

3.4.2 Character Attributes

The following character attributes can be displayed on the device:

– Normal
– Flashing
– Underlined
– Inverse

3.4.3 Fonts

You are able to use the Windows character sets. Further you can use the font "Normal" and the font "Zoom" or create and use your own character sets.

4 Interfaces of the Device

Depending on the device variant, several interfaces are available to you:

Table 4-1 Device variants

Order number	Available Interfaces							Connector				Com-mand Devic es	
	USB Host	Ethernet	RS232 (Communication)	PROFIBUS-DP	MPI	CAN	DeviceNet	Open Cable End	16 Pin Connector	19 Pin Connector	Wire-end Sleeve and RJ-45	Emergency Stop/Stop Push-button	Consent Switch
HT06Ax-xx/70 x xx x/x x x/00 xxx	X	X	-	-	-	-	-	X	-	-	-	X	X
HT06Ax-xx/70 x xx x/x x x/03 xxx	X	X	-	-	-	-	-	-	-	X	-	X	X
HT06Ax-xx/70 x xx x/x x x/04 xxx	X	X	-	-	-	-	-	-	-	-	X	X	X
HT06Ax-xx/71 x xx x/x x x/00 xxx	X	-	X	-	-	-	-	X	-	-	-	X	X
HT06Ax-xx/71 x xx x/x x x/01 xxx	X	-	X	-	-	-	-	-	X	-	-	X	X
HT06Ax-xx/72 x xx x/x x x/00 xxx	X	-	-	X	-	-	-	X	-	-	-	X	X
HT06Ax-xx/72 x xx x/x x x/01 xxx	X	-	-	X	-	-	-	-	X	-	-	X	X
HT06Ax-xx/72 x xx x/x x x/02 xxx	X	-	-	X	-	-	-	-	-	X	-	X	X
HT06Ax-xx/73 x xx x/x x x/00 xxx	X	-	-	-	X	-	-	X	-	-	-	X	X
HT06Ax-xx/73 x xx x/x x x/01 xxx	X	-	-	-	X	-	-	-	X	-	-	X	X
HT06Ax-xx/73 x xx x/x x x/02 xxx	X	-	-	-	X	-	-	-	-	X	-	X	X
HT06Ax-xx/74 x xx x/x x x/00 xxx	X	-	-	-	-	X	-	X	-	-	-	X	X
HT06Ax-xx/74 x xx x/x x x/01 xxx	X	-	-	-	-	X	-	-	X	-	-	X	X
HT06Ax-xx/75 x xx x/x x x/00 xxx	X	-	-	-	-	-	X	X	-	-	-	X	X
HT06Ax-xx/75 x xx x/x x x/01 xxx	X	-	-	-	-	-	X	-	X	-	-	X	X

4.1 CAN

The CAN bus is a high speed bus in accordance with ISO-DIS 11898.

4.1.1 Pin / Cable Assignment

Pin / cable assignment for open cable end or 16 pin device connector.

Table 4-2 Pin / cable assignment for open cable end or 16 pin device connector

Pin	Wire	ø mm²	Design.	Function
8	BK	0,5	0 V	Supply Voltage 0 VDC
9	VT	0,5	+ 24 V	Supply Voltage 24 VDC
10	YE	0,5	⏚	Low-Noise Ground
16	GN	0,25	CANL (IN)	CAN_L Bus Line (Dominant LOW) Feeder Cable
15	RD	0,25	CANH (IN)	CAN_H Line (Dominant HIGH) Feeder Cable
7	GR	0,25	GND	Ground
13	WH	0,25	CANL (OUT)	CAN_L Line (Dominant LOW) Return Cable
14	BN	0,25	CANH (OUT)	CAN_H Line (Dominant HIGH) Return Cable
5	WHYE	0,25	Ö	Emergency Stop / Stop Channel 1 (Normally Closed)
6	BNGN	0,25	Ö	Emergency Stop / Stop Channel 1 (Normally Closed)
3	BU	1,0	Ö	Emergency Stop / Stop Channel 2 (Normally Closed)
4	BN	1,0	Ö	Emergency Stop / Stop Channel 2 (Normally Closed)
1	RDBU	0,25	S	Consent Switch Channel 1 (Normally Open Contact)
11	PK	0,25	S	Consent Switch Channel 1 (Normally Open Contact)
2	WHGN	0,25	S	Consent Switch Channel 2 (Normally Open Contact)
12	OR	0,25	S	Consent Switch Channel 2 (Normally Open Contact)

Gray underlayed entries are optionally available only.

For operating devices with open cable ends, make sure to connect the shield with the protective ground.

4.1.2 Termination

The operating device is configured as a participant. At use as last device you have to use a terminating resistor (RAb=120 ohms) between the wires WH and BN.

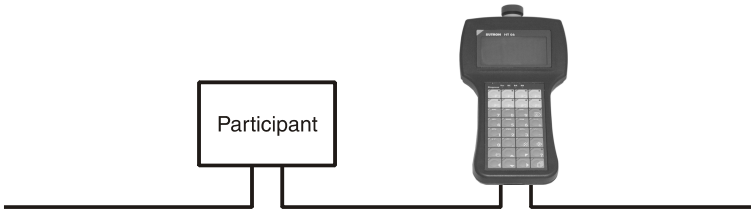


Figure 4-1 Operating device as participant

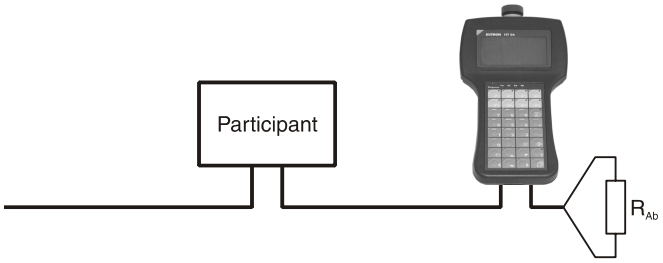


Figure 4-2 Operating device as last device

4.2 DeviceNet

4.2.1 Pin / Cable Assignment

Pin / cable assignment for open cable end or 16 pin device connector.

Table 4-3 Pin / cable assignment for open cable end or 16 pin device connector

Pin	Wire	ø mm²	Design.	Function
8	BK	0,5	0 V	Supply Voltage 0 VDC
9	VT	0,5	+ 24 V	Supply Voltage 24 VDC
10	YE	0,5	⏚	Low-Noise Ground
16	GN	0,25	CANL (IN)	CAN_L Bus Line (Dominant LOW) Feeder Cable
15	RD	0,25	CANH (IN)	CAN_H Bus Line (Dominant HIGH) Feeder Cable
7	GR	0,25	GND	Ground
13	WH	0,25	CANL (OUT)	CAN_L Bus Line (Dominant LOW) Return Cable
14	BN	0,25	CANH (OUT)	CAN_H Bus Line (Dominant HIGH) Return Cable
5	WHYE	0,25	Ö	Emergency Stop / Stop Channel 1 (Normally Closed)
6	BNGN	0,25	Ö	Emergency Stop / Stop Channel 1 (Normally Closed)
3	BU	1,0	Ö	Emergency Stop / Stop Channel 2 (Normally Closed)
4	BN	1,0	Ö	Emergency Stop / Stop Channel 2 (Normally Closed)
1	RDBU	0,25	S	Consent Switch Channel 1 (Normally Open Contact)
11	PK	0,25	S	Consent Switch Channel 1 (Normally Open Contact)
2	WHGN	0,25	S	Consent Switch Channel 2 (Normally Open Contact)
12	OR	0,25	S	Consent Switch Channel 2 (Normally Open Contact)

Gray underlayed entries are optionally available only.

For operating devices with open cable ends, make sure to connect the shield with the protective ground.

4.2.2 Termination

The operating device is configured as a participant. At use as last device you have to use a terminating resistor (RAb=120 ohms) between the wires WH and BN.

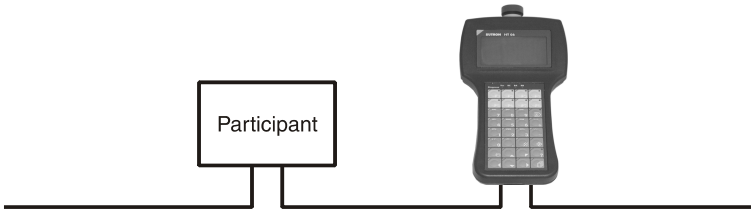


Figure 4-3 Operating device as participant

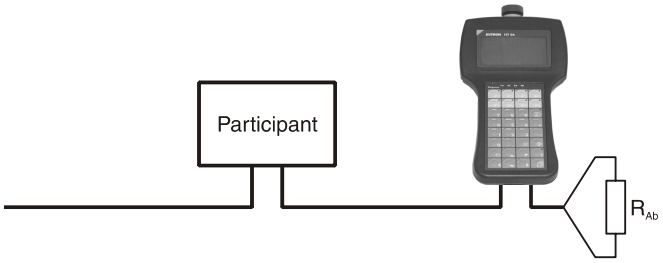


Figure 4-4 Operating device as last device

4.3 Ethernet

A 10/100 Base-T Ethernet interface is located at the operating device.

4.3.1 Pin / Cable Assignment

Pin / cable assignment for open cable end or 19 pin device connector for connection box.

The cable tree for Ethernet corresponds to CAT 5.

Table 4-4 Pin / cable assignment for open cable end or 19 pin device connector

Pin	Wire	ø mm²	Design.	Function
1	GN	0,34	0 V	Supply Voltage 0 VDC
2	BN	0,34	+ 24 V	Supply Voltage 24 VDC
12	YE	0,34	⏚	Low-Noise Ground
15	GR	0,34	nc	Not Connected
19	WH	0,34	nc	Not Connected
9	RD	0,34	Ö	Emergency Stop / Stop Channel 1 (Normally Closed)
16	PK	0,34	Ö	Emergency Stop / Stop Channel 1 (Normally Closed)
7	BU	0,34	Ö	Emergency Stop / Stop Channel 2 (Normally Closed)
8	BK	0,34	Ö	Emergency Stop / Stop Channel 2 (Normally Closed)
10	WHGN	0,34	S	Consent Switch Channel 1 (Normally Open Contact)
11	VT	0,34	S	Consent Switch Channel 1 (Normally Open Contact)
17	GRPK	0,34	S	Consent Switch Channel 2 (Normally Open Contact)
18	RDBU	0,34	S	Consent Switch Channel 2 (Normally Open Contact)
3	YE	0,15	TX+	Ethernet TX+
4	GN	0,15	TX-	Ethernet TX-
5	PK	0,15	RX+	Ethernet RX+
6	BU	0,15	RX-	Ethernet RX-

Gray underlayed entries are optionally available only.

For operating devices with open cable ends, make sure to connect the shield with the protective ground.

Pin / cable assignment with wire-end sleeves for supply voltage and RJ-45 connector for Ethernet.

The cable tree for Ethernet corresponds to CAT 5.

Table 4-5 Pin / cable assignment with wire-end sleeves and RJ-45 connector

Wire-end	Wire	ø mm²	Design.	Function
Wire-end Sleeve	GN	0,34	0 V	Supply Voltage 0 VDC
Wire-end Sleeve	BN	0,34	+ 24 V	Supply Voltage 24 VDC
Wire-end Sleeve	YE	0,34	⏚	Low-Noise Ground
Open	GR	0,34	nc	Not Connected
Open	WH	0,34	nc	Not Connected
Open	RD	0,34	Ö	Emergency Stop / Stop Channel 1 (Normally Closed)
Open	PK	0,34	Ö	Emergency Stop / Stop Channel 1 (Normally Closed)
Open	BU	0,34	Ö	Emergency Stop / Stop Channel 2 (Normally Closed)
Open	BK	0,34	Ö	Emergency Stop / Stop Channel 2 (Normally Closed)
Open	WHGN	0,34	S	Consent Switch Channel 1 (Normally Open Contact)
Open	VT	0,34	S	Consent Switch Channel 1 (Normally Open Contact)
Open	GRPK	0,34	S	Consent Switch Channel 2 (Normally Open Contact)
Open	RDBU	0,34	S	Consent Switch Channel 2 (Normally Open Contact)
RJ-45 Pin 1	YE	0,15	TX+	Ethernet TX+
RJ-45 Pin 2	GN	0,15	TX-	Ethernet TX-
RJ-45 Pin 3	PK	0,15	RX+	Ethernet RX+
RJ-45 Pin 6	BU	0,15	RX-	Ethernet RX-

Gray underlayed entries are optionally available only.

For operating devices with open cable ends, make sure to connect the shield with the protective ground.

4.3.2 Connection Box

To connect the HT06AT with Ethernet interface and the 19 pin device connector to the network, the power supply and with optional command devices uncomplicatedly, you use the connection box.

Table 4-6 Wiring plan for connection box

Signal Name	HT06AT	Ethernet	Supply Voltage	Command Devices
	X1.	X2.	X3.	X4.
Ethernet Tx+	3	1		
Ethernet Tx-	4	2		
Ethernet Rx+	5	3		
Ethernet Rx-	6	6		
Low-Noise Ground	12		1	
Supply Voltage OV DC	1		2	
Supply Voltage 24V DC	2		3	
nc	15		4	
nc	19		5	
Emergency Stop Channel 1 (Normally Closed)	9			6
Emergency Stop Channel 1 (Normally Closed)	16			5
Emergency Stop Channel 2 (Normally Closed)	7			8
Emergency Stop Channel 2 (Normally Closed)	8			7
Consent Switch Channel 1 (Normally Open)	10			4
Consent Switch Channel 1 (Normally Open)	11			3
Consent Switch Channel 2 (Normally Open)	17			2
Consent Switch Channel 2 (Normally Open)	18			1

The connection box has brackets for the top hat rail assembly on the back.

See chapter “Ordering Data“ on page 7-1.

4.4 INTERBUS

4.4.1 Pin / Cable Assignment

Pin / cable assignment for open cable end or 16 pin device connector.

Table 4-7 Pin / Cable Assignment

Pin	Wire	ø mm²	Design.	Function
8	BK	0,5	0 V	Supply Voltage 0 VDC
9	VT	0,5	+ 24 V	Supply Voltage 24 VDC
10	YE	0,5	⏚	Low-Noise Ground
16	GN	0,25	/DO1	Data Output Inverted
15	RD	0,25	DO1	Data Output
7	GR	0,25	GND	Ground
13	WH	0,25	DI1	Data Input
14	BN	0,25	/DI1	Data Input Inverted
5	WHYE	0,25	Ö	Emergency Stop / Stop Channel 1 (Normally Closed)
6	BNGN	0,25	Ö	Emergency Stop / Stop Channel 1 (Normally Closed)
3	BU	1,0	Ö	Emergency Stop / Stop Channel 2 (Normally Closed)
4	BN	1,0	Ö	Emergency Stop / Stop Channel 2 (Normally Closed)
1	RDBU	0,25	S	Consent Switch Channel 1 (Normally Open Contact)
11	PK	0,25	S	Consent Switch Channel 1 (Normally Open Contact)
2	WHGN	0,25	S	Consent Switch Channel 2 (Normally Open Contact)
12	OR	0,25	S	Consent Switch Channel 2 (Normally Open Contact)

Gray underlayed entries are optionally available only.

For operating devices with open cable ends, make sure to connect the shield with the protective ground.

4.4.2 Termination

You only can use the operating device as last device.

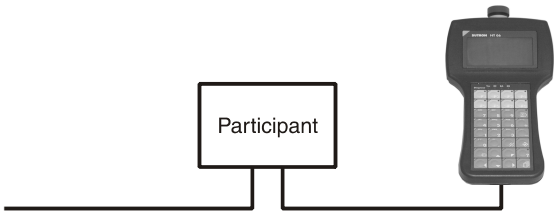


Figure 4-5 Operating device as last device

4.5 MPI

4.5.1 Pin / Cable Assignment

Pin / cable assignment for open cable end or 16 pin device connector.

Table 4-8 Pin / cable assignment for open cable end or 16 pin device connector

Pin	Wire	ø mm²	Design.	Function
8	BK	0,5	0 V	Supply Voltage 0 VDC
9	VT	0,5	+ 24 V	Supply Voltage 24 VDC
10	YE	0,5	⏚	Low-Noise Ground
16	GN	0,25	RxD/TxD-N	Received Data / Transmitted Data Minus
15	RD	0,25	RxD/TxD-P	Received Data / Transmitted Data Plus
7	GR	0,25	DGND	Data Transmission Potential
13	WH	0,25	CNTR-P	Repeater Control Signal Plus
14	BN	0,25	CNTR-N	Repeater Control Signal Minus
5	WHYE	0,25	Ö	Emergency Stop / Stop Channel 1 (Normally Closed)
6	BNGN	0,25	Ö	Emergency Stop / Stop Channel 1 (Normally Closed)
3	BU	1,0	Ö	Emergency Stop / Stop Channel 2 (Normally Closed)
4	BN	1,0	Ö	Emergency Stop / Stop Channel 2 (Normally Closed)
1	RDBU	0,25	S	Consent Switch Channel 1 (Normally Open Contact)
11	PK	0,25	S	Consent Switch Channel 1 (Normally Open Contact)
2	WHGN	0,25	S	Consent Switch Channel 2 (Normally Open Contact)
12	OR	0,25	S	Consent Switch Channel 2 (Normally Open Contact)

Gray underlayed entries are optionally available only.

For operating devices with open cable ends, make sure to connect the shield with the protective ground.

Pin / cable assignment with 19 pin device connector for HMI Linkbox HL01 DP/MPI.

Table 4-9 Pin / cable assignment with 19 pin device connector for HMI Linkbox HL01 DP/MPI

Pin	Wire	ø mm²	Design.	Function
1	BK	0,5	0 V	Supply Voltage 0 VDC
2	VT	0,5	+ 24 V	Supply Voltage 24 VDC
12	YE	0,5	⏚	Low-Noise Ground
13	GN	0,25	RxD/TxD-N	Received Data / Transmitted Data Minus
11	RD	0,25	RxD/TxD-P	Received Data / Transmitted Data Plus
18	GR	0,25	DGND	Data Transmission Potential
14	WH	0,25	CNTR-P	Repeater Control Signal Plus
9	WHYE	0,25	Ö	Emergency Stop / Stop Channel 1 (Normally Closed)
16	BNGN	0,25	Ö	Emergency Stop / Stop Channel 1 (Normally Closed)
7	BU	1,0	Ö	Emergency Stop / Stop Channel 2 (Normally Closed)
8	BN	1,0	Ö	Emergency Stop / Stop Channel 2 (Normally Closed)
6	RDBU	0,25	S	Consent Switch Channel 1 (Normally Open Contact)
10	PK	0,25	S	Consent Switch Channel 1 (Normally Open Contact)
17	WHGN	0,25	S	Consent Switch Channel 2 (Normally Open Contact)
19	OR	0,25	S	Consent Switch Channel 2 (Normally Open Contact)
3				Jumper in Device Connector to Pin 4
4				Jumper in Device Connector to Pin 3
5				Jumper in Device Connector to Pin 15
15				Jumper in Device Connector to Pin 5

Gray underlayed entries are optionally available only.

4.5.2 Cable

Any cable that conforms with the following parameters can be used:

Table 4-10 Cable characteristics MPI

Parameters	Value
Loop Resistance	110 Ohm/km
Capacitance	30 nF/km
Surge Impedance	150 Ohm

The maximum length of one segment is 50 m which cannot be exceeded. This 50 m applies from the first node to the last node in the segment.

For further information on the installation, please refer to the Siemens manual "SIMATIC S7-400 and M7-400 Programmable Controllers Hardware and Installation, 6ES7498-8AA03-8BA0".

4.5.3 Termination

The operating device is configured as last device. The termination is inside the device and can not be switched off. At operation as a participant you have to use repeaters.

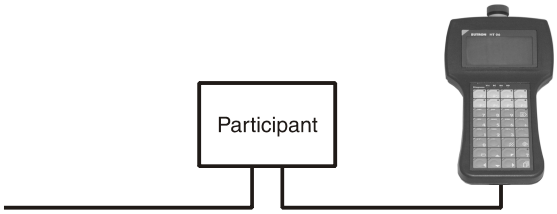


Figure 4-6 Operating device as last device

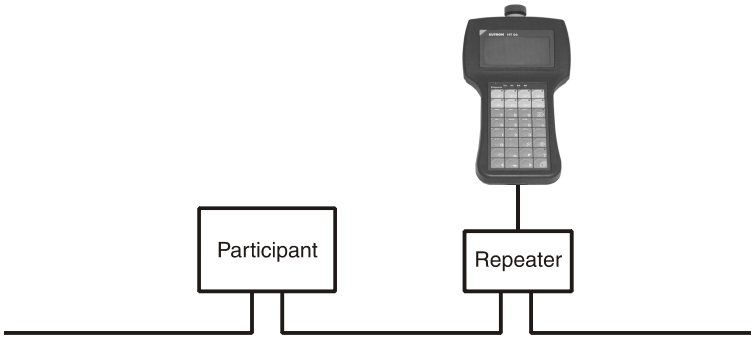


Figure 4-7 Operating device as participant with repeater

4.6 PROFIBUS-DP

4.6.1 Pin / Cable Assignment

Pin / cable assignment for open cable end or 16 pin device connector.

Table 4-11 Pin / cable assignment for open cable end or 16 pin device connector

Pin	Wire	ø mm²	Design.	Function
8	BK	0,5	0 V	Supply Voltage 0 VDC
9	VT	0,5	+ 24 V	Supply Voltage 24 VDC
10	YE	0,5	⏚	Low-Noise Ground
16	GN	0,25	RxD/TxD-N	Received Data / Transmitted Data Minus
15	RD	0,25	RxD/TxD-P	Received Data / Transmitted Data Plus
7	GR	0,25	DGND	Data Transmission Potential
13	WH	0,25	CNTR-P	Repeater Control Signal Plus
14	BN	0,25	CNTR-N	Received Data / Transmitted Data Minus
5	WHYE	0,25	Ö	Emergency Stop / Stop Channel 1 (Normally Closed)
6	BNGN	0,25	Ö	Emergency Stop / Stop Channel 1 (Normally Closed)
3	BU	1,0	Ö	Emergency Stop / Stop Channel 2 (Normally Closed)
4	BN	1,0	Ö	Emergency Stop / Stop Channel 2 (Normally Closed)
1	RDBU	0,25	S	Consent Switch Channel 1 (Normally Open Contact)
11	PK	0,25	S	Consent Switch Channel 1 (Normally Open Contact)
2	WHGN	0,25	S	Consent Switch Channel 2 (Normally Open Contact)
12	OR	0,25	S	Consent Switch Channel 2 (Normally Open Contact)

Gray underlayed entries are optionally available only.

For operating devices with open cable ends, make sure to connect the shield with the protective ground.

Pin / cable assignment with 19 pin device connector for HMI Linkbox HL01 DP/MPI.

Table 4-12 Pin / cable assignment with 19 pin device connector for HMI Linkbox HL01 DP/MPI

Pin	Wire	ø mm²	Design.	Function
1	BK	0,5	0 V	Supply Voltage 0 VDC
2	VT	0,5	+ 24 V	Supply Voltage 24 VDC
12	YE	0,5	⏚	Low-Noise Ground
13	GN	0,25	RxD/TxD-N	Received Data / Transmitted Data Minus
14	RD	0,25	RxD/TxD-P	Received Data / Transmitted Data Plus
18	GR	0,25	DGND	Data Transmission Potential
11	WH	0,25	CNTR-P	Repeater Control Signal Plus
9	WHYE	0,25	Ö	Emergency Stop / Stop Channel 1 (Normally Closed)
16	BNGN	0,25	Ö	Emergency Stop / Stop Channel 1 (Normally Closed)
7	BU	1,0	Ö	Emergency Stop / Stop Channel 2 (Normally Closed)
8	BN	1,0	Ö	Emergency Stop / Stop Channel 2 (Normally Closed)
6	RDBU	0,25	S	Consent Switch Channel 1 (Normally Open Contact)
10	PK	0,25	S	Consent Switch Channel 1 (Normally Open Contact)
17	WHGN	0,25	S	Consent Switch Channel 2 (Normally Open Contact)
19	OR	0,25	S	Consent Switch Channel 2 (Normally Open Contact)
3				Jumper in Device Connector to Pin 4
4				Jumper in Device Connector to Pin 3
5				Jumper in Device Connector to Pin 15
15				Jumper in Device Connector to Pin 5

Gray underlayed entries are optionally available only.

4.6.2 Cable

Any PROFIBUS-DP-approved cables specified in the EN 50170 as cable type A can be used.

Table 4-13 Cable characteristics PROFIBUS

Parameters	Value
Impedance	136 to 165 Ohm
Capacitance	< 30 pf/m
Loop Resistance	110 Ohm/km
Wire Gauge	0.64 mm

The maximum cable length depends on the baud rate (DIN EN 19245 Part 3).

Table 4-14 Baud rate PROFIBUS-DP

Baud Rate	Cable Length
187.5 kBit/s	1000 m
500 kBit/s	400 m
1500 kBit/s	200 m
3000 to 12000 kBit/s	100 m

4.6.3 Termination

The operating device is configured as last device. The termination is inside the device and can not be switched off. At operation as a participant you have to use repeaters.

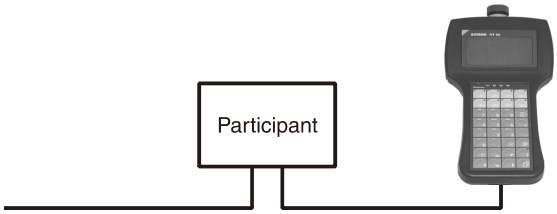


Figure 4-8 Operating device as last device

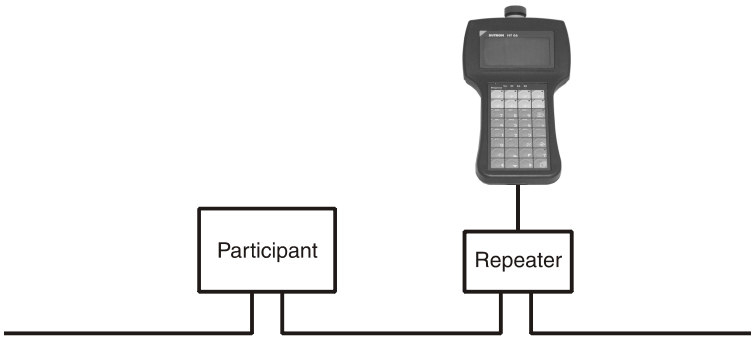


Figure 4-9 Operating device as participant with repeater

4.7 RS232 (Communication)

The interface is suitable to establish a point-to-point connection.

4.7.1 Pin / Cable Assignment

Pin / cable assignment for open cable end or 16 pin device connector

Table 4-15 Pin / Cable Assignment

Pin	Wire	ø mm²	Design.	Function
8	BK	0,5	0 V	Supply Voltage 0 VDC
9	VT	0,5	+ 24 V	Supply Voltage 24 VDC
10	YE	0,5	⏚	Low-Noise Ground
16	GN	0,25	RD	Received Data
15	RD	0,25	CTS	Clear to Send
7	GR	0,25	GND	Ground
13	WH	0,25	TD	Transmitted Data
14	BN	0,25	RTS	Request to Send
5	WHYE	0,25	Ö	Emergency Stop / Stop Channel 1 (Normally Closed)
6	BNGN	0,25	Ö	Emergency Stop / Stop Channel 1 (Normally Closed)
3	BU	1,0	Ö	Emergency Stop / Stop Channel 2 (Normally Closed)
4	BN	1,0	Ö	Emergency Stop / Stop Channel 2 (Normally Closed)
1	RDBU	0,25	S	Consent Switch Channel 1 (Normally Open Contact)
11	PK	0,25	S	Consent Switch Channel 1 (Normally Open Contact)
2	WHGN	0,25	S	Consent Switch Channel 2 (Normally Open Contact)
12	OR	0,25	S	Consent Switch Channel 2 (Normally Open Contact)

Gray underlayed entries are optionally available only.

For operating devices with open cable ends, make sure to connect the shield with the protective ground.

4.8 USB

A USB Host (A) interface is on the left side under the rubber cover. The rubber cover is fastened within the device everlasting.

NOTICE
Using input devices not suitable for industrial use (e.g. keyboard, mouse) may decrease safety of operation. This includes input devices intended for home and office use.

NOTICE
Without the rubber cap put on the device does not correspond to the protection type IP54!

Figure 4-10 View with a USB stick plugged in

5 Maintenance and Servicing

5.1 Maintenance Interval

The following maintenance intervals are recommended for this operating device:

Table 5-1 Maintenance interval

Maintenance work	Interval
Changing the Battery	4 Years

5.2 Front Panel

Only use a damp cloth to remove any dirt from the front panel.

5.3 Fuse

NOTICE: Damage
The semiconductor fuse cannot be replaced!

A semiconductor fuse is used to protect the device. Once the fuse has been tripped, the device must be disconnected from the supply voltage to allow the semiconductor fuse to regenerate. At an ambient temperature of 20 °C (68 °F), the regeneration takes approximately 20 seconds. The higher the ambient temperature, the longer the regeneration takes.

5.4 Battery

The built-in battery preserves the data in the CMOS-RAM and supplies the real-time clock. The minimum battery life is 5 years, even under unfavorable operating conditions. When the battery runs down, the message „Change battery“ is generated automatically.

We recommend you change the battery approximately every 4 years as part of the regular maintenance work. A prepared battery including connector can be obtained directly from Sütron electronic.

If the „Change battery“ message is detected too late, e.g. the real-time clock stopped or shows the wrong date, data in the CMOS-RAM may have already been lost. For this reason, after changing a battery, always check data such as passwords that can be modified, parameters in the system variables, recipe data sets and entries in the message system.

5.4.1 Changing the Battery

NOTICE: Damage
Batteries must only be changed by authorized and trained experts!

NOTICE: Damage
For changing the battery you may only use replacement batteries of Sütron electronic.

NOTICE: Damage
Electrostatic discharge can damage electronic components. Observe the ESD protective measures!

CAUTION: Explosive
Do not throw lithium batteries into fire, do not heat to 100 °C or higher and do not recharge.

CAUTION: Toxic
Do not open lithium batteries.

NOTICE: Damage
When opening and closing the operating device, you must take care not to damage the seal and make sure that it always sits in the slot provided.

To ensure that the data in the SRAM and the time are preserved, it is possible to change the battery under operating voltage. Observe the corresponding safety notices!

1. Remove the screws on the rear of the device and lift off the enclosure.
2. If necessary remove the connectors for Ethernet and USB.
3. Disconnect the connector from the battery and remove the dead battery.
4. Plug in the cable for the new battery.
5. Remove the protection paper from the glue strip of the battery.
6. Attach the new battery within the red highlighted area on the circuit board. See figure „Battery in the HT06AT“ on page 5-3.
7. Reconnect the connectors for Ethernet and USB.
8. Place the enclosure back onto the device.
9. Carefully tighten the screws of the enclosure.

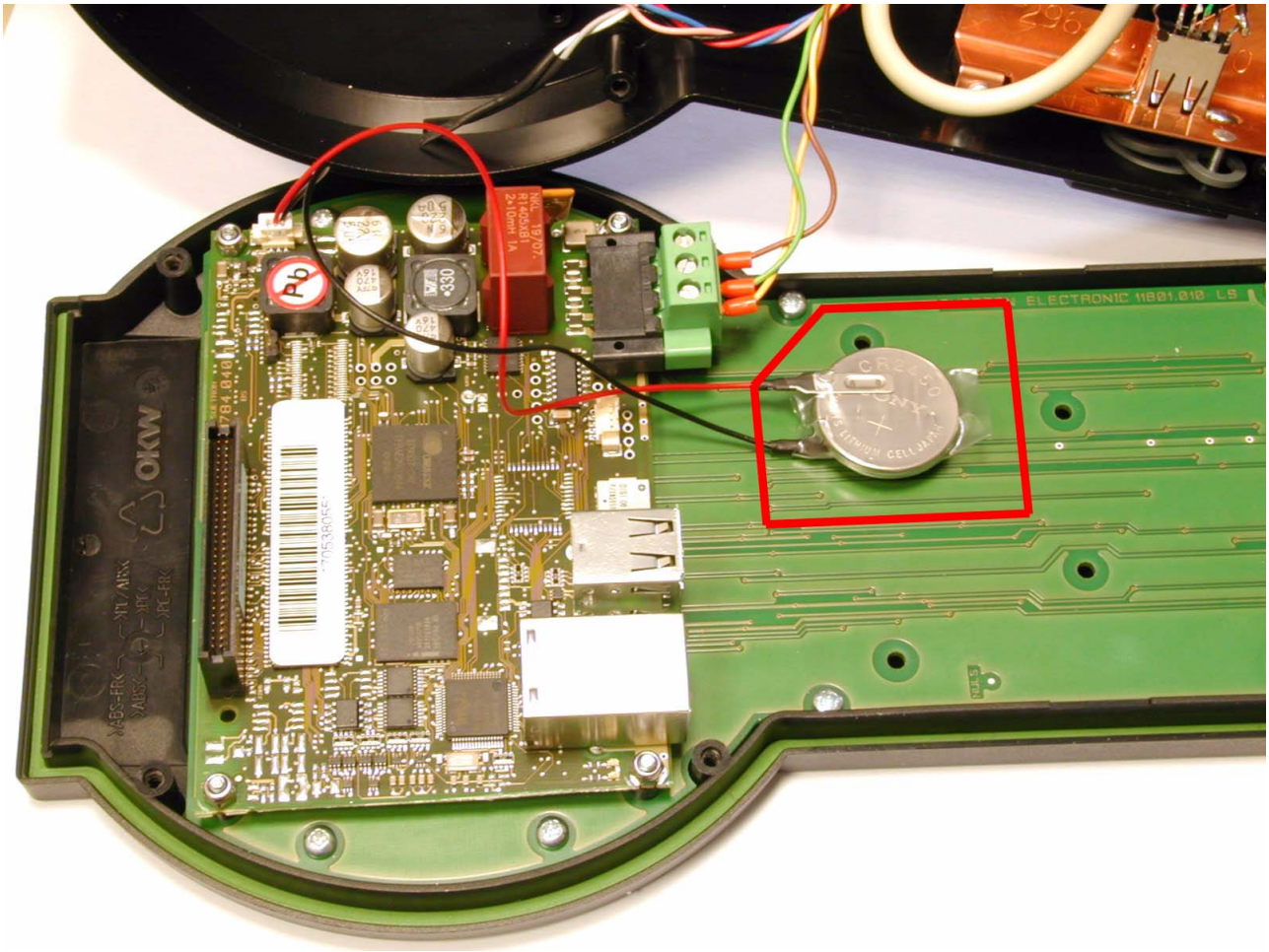
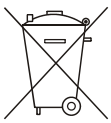


Figure 5-1 Battery in the HT06AT

5.4.2 Battery Disposal



The manufacturer is obliged to mark batteries with this symbol before first placing into market. The symbol is extended by the chemical symbols if the following limiting values are exceeded:

More than 0.0005 mass percent mercury	Hg
More than 0.002 mass percent cadmium	Cd
More than 0.004 mass percent lead	Pb

Batteries can be given back free of charge after use at the place of purchase.

According to the §11 of the battery law, final consumers are obligedly to give old batteries back to gathering points which attached to the common take back system or manufacturer-specific take back systems.

NOTICE: Damage
To prevent short circuitry in the collection boxes, insulate the poles of each battery with insulation tape or put each single battery into a plastic bag.

6 Technical Data

Display	
Type	TFT (color)
Resolution (pixels)	320 x 240
Colors	65536
Reading angle	90°
Contrast setting	-
Half-life backlighting	30,000 h
Brightness in cd/m^2	45
Display area (H x W) in mm (Inch)	57.6 x 76.8 (2.268 x 3.024)

Keyboard	
Type	Short-stroke Keyboard
Number of keys	36
Key area (raised)	9 mm (0.354“)
Actuator travel	0.7 mm (0.027“)
Actuating force	2.8 N
Lifetime (min.)	1 Million Switching Cycles
Display elements (status LEDs)	15

Emergency Stop and Stop Push-button	
Type	Rafi RAFIX 22 FS
Mechanical Lifetime	50,000 Switching Cycles
Electrical Lifetime	10^5 Switching Cycles at 250 V / 1 A 10^4 Switching Cycles at 250 V / 2 A 30,000 Switching Cycles at 250 V / 4 A
Switching Element	Rafi RAFIX 22 NOT-AUS 2Ö
Maximum voltage	24 V AC/DC
Maximum current	1 A
Contact Configuration	2 Breakers
Emergency Stop and Stop Push-button	

Consent Switch	
Type	IDEC HE3B-M2PB
Mechanical Lifetime	Step 1-2-1: 10^6 Switching Cycles Step 1-2-3-1: 10^5 Switching Cycles
Electrical Lifetime	10^5 Switching Cycles
Maximum voltage	24 V AC/DC
Maximum current	1 A
Contact Configuration	2 Changeover Contacts

Electrical Data	
Supply voltage	24 V DC (SELV in accordance with DIN EN 61131)
Residual ripple	10 % maximum
Minimum voltage	18 V
Maximum voltage	30 V
Power consumption (typical at 24 V)	0.2 A
Power consumption (maximum)	0.3 A
Connected load	4.8 W
Fuse	Semiconductor fuse, self-resetting
Protection against polarity reversal	Integrated

Ethernet	
Ethernet	10/100 Base-T

Field Bus Interfaces	
Variable Baud Rates and Data Formats	
CAN	According to ISO 11898 Electrically Isolated
DeviceNet	According to ISO 11898 Electrically Isolated
MPI	Electrically Isolated
PROFIBUS-DP	Electrically Isolated

Central Processing Unit	
Central processing unit	RISC ARM9
Clock frequency	200 MHz
Other features	Watchdog timer, real-time clock, battery monitoring

Memory	
Application memory	3 MByte
Flash	16 MByte
SDRAM	32 MByte
SRAM	512 KByte

Connection System
Circular Connector, 16 Pin, Bajonett (CONINVERS; Series TU)
Circular Connector, Angled, 16 Pin (Hummel Metall- und Kunststofftechnik GmbH, 7301500000)
Panel Connector, 16 Pin (Hummel Metall- und Kunststofftechnik GmbH 7471500000)
Coupling Connector, 16 Pin (Hummel Metall- und Kunststofftechnik GmbH 7201500000)

Connecting Cable	
Diameter	10.80 +/- 0.35 mm (0.425 +/- 0.014")
Weight	Approx. 172 g/m
Bending Radius	Once: >/= 5 x Cable Diameter Several Times: >/= 12 x Cable Diameter
UL Approved According to Style 20233, 80 °C (176 °F), 300 V	

Environmental Conditions	
Temperature during operation	0 °C to 50 °C (32 °F to 122 °F)
Temperature during storage, transport	- 25 °C to + 70 °C (-13°F to + 158°F)
Relative air humidity for operation and storage	20 % to 85 %, no condensation
Application area	Degree of pollution 1, overvoltage category II

Standards and Guidelines	
Interference Immunity	EN 61000-4-2 EN 61000-4-3 EN 61000-4-4 EN 61000-4-5 EN 61000-4-6 EN 61000-6-2
Emitted Interference	EN 50011 Limit Class Value A
Equipment Requirements	EN 61131
Storage and Transportation	EN 61131 Part 2
Power Supply	EN 61131 Part 2
Electromagnetic Compatibility	2004/108/EG
Degree of Protection	EN 60529
Impact Load, Shocks	EN 60068 Part 2-27
Sinusoidal Vibrations	EN 60068 Part 2-6
Corrosion Protection	IEC 60068

NOTICE: Radio Interference
This is a class A device. This device may cause radio interference in residential areas. In this case, the user may be required to introduce appropriate countermeasures, and to bear the cost of same.

Enclosure	
Type	OKW DATEC CONTROL L
Color	RAL 9005
Material	ABS
Flammability	HB According to UL94
Degree of Protection	IP54
Total Weight without Connection Cable	About 590 g without Protector About 770 g with Protector

7 Ordering Data

Table 7-1 Accessories

Description	Article No.
USB 2.0 memory stick 1 GB	81152.100
Battery, assembled with cable and connector (Type: CR2450)	66779.000
Protector with holding belt	29635.800
Panel connector, 16 pin, female, front wall mounting, manufacturer Hummel Element with soldering contacts	57320.000 57323.000
Panel connector, 16 pin, female, front wall mounting, manufacturer Coninvers Crimp contact female	57337.100 57337.501
Connection box for HT06AT with Ethernet interface and circular connector	81310.000
Hook with magnet	27265.000
Wall mounting for hook	27265.100

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